ASSIGNMENT 6

Textbook Assignment: "Instruments," Shipboard Electrical Equipment," and "Environmental Controls," chapters 11, 12, and 13, pages 11-1 through 13-7.

6-1. In a shipboard engineering plant, the instruments let operating personnel perform which of the following tasks?

1. Determine if machinery is operating within a prescribed range
2. Determine the operating efficiency of the plant
3. Provide data for reports and records
4. Each of the above

6-2. On a pressure gauge, the red hand (if installed) should be set at what point?

1. Zero
2. Slightly above the maximum normal operating pressure only
3. Slightly below the minimum normal operating pressure only
4. Slightly above or slightly below the maximum or minimum normal operating pressure

6-3. A Bourdon-tube gauge operates on what principal?

1. Volume changes in a straight tube tend to expand the tube
2. Volume changes in a coiled tube tend to collapse the tube
3. Pressure in a straight tube tends to bend the tube
4. Pressure in a curved tube tends to straighten the tube

6-4. If a curved Bourdon tube is used to measure pressure that exceeds 200 psi, it is made from what metal?

1. Copper
2. Bronze
3. Steel
4. Lead

6-5. In a simplex gauge, the free end of the Bourdon tube is attached to the indicating mechanism by a

1. linkage assembly
2. wire
3. cam
4. bellows assembly

6-6. You would use a simplex Bourdon-tube gauge if you were taking which of the following measurements?

1. The water depth in a freshwater tank
2. The amount of fuel oil flowing through a valve
3. The pressure in a compressed air system
4. The pressure drop between the inlet and the outlet side of a lube oil strainer

6-7. Vacuum gauges, which are used to indicate pressures below atmospheric pressure, have which of the following units of measurement?

1. Inches of water
2. Inches of mercury
3. Pressure per inch
4. Pressure per square inch

6-8. What Bourdon-tube gauge should you use to take pressure and vacuum measurements?

1. Duplex
2. Simplex
3. Compound
4. Differential

6-9. What type of gauge should be installed to check the pressure between the inlet and outlet sides of lube oil strainers?

1. Duplex
2. Simplex
3. Compound
4. Diaphragm

6-10. A bellows gauge can be used to take which of the following measurements?

1. Pressure up to 800 psig
2. Low pressures
3. Small pressure differentials
4. Each of the above

6-11. To measure pressure in the space between the inner and outer boiler casings, which of the following types of gauges is generally used?

1. A compound Bourdon-tube gauge
2. A duplex Bourdon-type gauge
3. A diaphragm gauge
4. A bellows gauge

6-12. A U-tube that is open to the atmosphere at one end and connected to a pressure source at the other end is known as a

1. bellows
2. manometer
3. diaphragm
4. Bourdon tube

6-13. The liquid in the capillary bore of a liquid-in-glass thermometer responds to a change in temperature by expanding or contracting, which causes what type of change, if any, in the thermometer graduations?

1. Relatively large
2. Relatively small
3. Inversely proportional
4. None

6-14. The element of a bimetallic expansion thermometer responds to a rise in temperature in what way?

1. By rising
2. By contracting
3. By changing colors
4. By changing the curvature

6-15. Which of the following is NOT a component of a distant-reading thermometer?

1. Bulb
2. Capillary tube
3. Thermocouple
4. Bourdon tube

6-16. Aboard ship, the exhaust temperature of diesel engines and heat-treatment furnaces is measured using what instrument?

1. A distant-reading thermometer
2. A bimetallic thermometer
3. A resistance thermometer
4. A pyrometer

6-17. The metals that make up the actuating element of a pyrometer respond to a rise in temperature by producing a/an

1. chemical reaction
2. electrical current
3. mechanical change

6-18. In the newer propulsion plants, temperatures are remotely monitored. Thermocouple temperature detectors are used with what other components to provide indications and alarms to the various engineering consoles?

1. Signal conditioners
2. Signal multipliers
3. Signal processors
4. Signal reversers

6-19. A resistive temperature detector (RTD) with a nickel element Is used to measure temperatures in which of the following ranges?

1. 400° to 600°F
2. 600° to 800 °F
3. 800° to 1,000°F
4. 1,000° to 1,200°F

6-20. The RTD elements designed for 600°F or greater service are made of what metal?

1. Copper
2. Nickel
3. Platinum
4. Silver

6-21. As temperature increases around an RTD, what will happen to the corresponding resistance of the RTD?

1. It remains the same
2. It increases by a proportional value
3. It decreases by a proportional value
4. It fluctuates erratically

6-22. You are troubleshooting an RTD circuit. What is indicated by a very low or zero meter reading?

1. A short circuit
2. An open circuit
3. An abnormal reading; but not an immediate problem condition
4. A normal reading; circuit malfunction is not indicated

6-23. If the RTD of a 0° to 300°F meter were to open, you would expect to receive which of the following indications?

1. 100°F
2. 200°F
3. 300 °F
4. 0°F

6-24. At the shipboard level, what corrective maintenance should you perform on a defective RTD?

1. Remove the RTD and repair it in the shop
2. Remove the RTD and replace it with a new one
3. Repair the RTD in place

6-25. Meters on control consoles display units of pressure or temperature; but, they are actually what type of meter?

1. Ohmmeter
2. Ammeter
3. Dc voltmeter
4. Wattmeter

6-26. Voltmeters installed in switchboards (SWBD) and control consoles all have what type of resistive value?

1. Adjustable
2. Variable
3. Fixed
4. Indefinite

6-27. To allow an ammeter to handle high SWBD current, what component is installed with it?

1. A current transformer
2. A potential transformer
3. A step-down transformer
4. A step-up transformer

6-28. A failing generator is being operated in parallel with a good generator. Normally, the loss of which of the following outputs indicates this condition?

1. Voltage
2. Amperage
3. Frequency
4. Kilowatt load

6-29. You are observing a synchroscope, and the output frequency of the oncoming generator and the on-line generator is the same. What indication will you receive from the moving element (pointer)?

1. It holds a fixed position
2. It rotates slow in the fast direction
3. It rotates fast in the slow direction
4. It oscillates erratically between the fast and slow directions

6-30. What condition is indicated when the three neon lamps located on the face of the phase-sequence indicators are lit?

1. Three cables are connected to the bus
2. The phase-sequence is correct
3. All three phases are energized
4. One of the three fuses has blown

6-31. Which of the following sensors is used to determine the specific level in a fuel tank at any given time ?

1. Tank level indicator (TLI)
2. Liquid level indicator (LLI)
3. Float level
4. Contact level

6-32. A typical TLI transmitter section contains what type of voltage network?

1. Multiplier resistor
2. Multiplier inductor
3. Divider resistor
4. Divider inductor

6-33. In a seawater-compensated fuel tank, the float of the TLI is designed to stay at what location?

1. At the top of the fuel
2. At the seawater/fuel interface
3. At the bottom of the seawater
4. Between the seawater/full interface and the top of the tank

6-34. To measure the rotational speed of a shaft, what instrument is commonly used?

1. A hydrometer
2. A tachometer
3. A manometer
4. A barometer

6-35. The propeller indicator mounted on the propulsion shaft can give which of the following information about the shaft rotation?

1. The direction of rotation
2. The number of revolutions
3. The speed of rotation
4. All of the above

6-36. What tachometer has a flashing light that determines the speed of a rotating shaft?

1. Hand-held mechanical
2. Resonant reed
3. Stroboscope
4. Chronometric

6-37. What instrument is used to indicate the salt content of the ship’s distilled water?

1. A liquid level indicator
2. A salinity indicator
3. A pressure indicator
4. A chemical indicator

6-38. To apply a specific, predetermined amount of torsion to a bolt on the main engine, you should use what type of wrench?

1. Torque
2. Rachet
3. Crescent
4. Combustion

6-39. While using a micrometer-setting torque wrench, the user knows the desired torque has been reached when

1. a predetermined setting iniates an audible click
2. the needle reaches the desired torque on the dial indicator
3. the deflecting beam reaches the desired torque
4. the pointer reaches the torque indicator

6-40. Before using a torque wrench, you should check which of the following labels?

1. Safety
2. Adjustment
3. Collimation
4. Calibration

6-41. Which of the following substances offers resistance to electric current?

1. Iron
2. Copper
3. Aluminum
4. Mica

6-42. What term defines the rate at which current passes through a circuit?

1. Ampere
2. volt
3. ohm
4. Watt

6-43. A unit of electrical resistance is known as a/an

1. watt
2. ampere
3. ohm
4. volt

6-44. A soldering iron is rated at 100 watts. This statement provides which of the following information about the soldering iron?

1. The power consumed by the soldering iron
2. The emf of the iron
3. The resistance of the iron
4. The rate at which current flows through the soldering iron

6-45. A shipboard generator operates at maximum efficiency under which of the following conditions?

1. At full-rated load
2. With all batteries fully charged
3. At periods of minimum power demand
4. When in series with other generators of the same rated output

6-46. The rotating member of a dc generator is known as the

1. field winding
2. armature
3. rotor
4. yoke

6-47. Most emergency generators installed on ships operate at what voltage and frequency, respectively?

1. 450 volts, 60 hertz
2. 220 volts, 50 hertz
3. 450 volts, 50 hertz
4. 110 volts, 60 hertz

6-48. Revolving-field generators are superior to revolving-armature generators for which of the following reasons?

1. The load current from the stator is connected to the external circuit without the use of a commutator
2. Only two slip rings are required to supply excitation
3. The stator windings are not subjected to mechanical stresses
4. All of the above

6-49. A high-speed, turbine-driven alternator is prevented from overheating by which of the following safety provisions?

1. An alternator used with other alternators that automatically goes off when it becomes warm
2. A forced air ventilation system that circulates air through the stator and rotor
3. A heat-limiting governor that controls the temperature
4. A metal structure surrounded by cold water that encases the alternator parts

6-50. Turbines that drive the ships service generators receive their energy from what source?

1. Batteries
2. Diesel engines
3. Saturated steam
4. Superheated steam

6-51. Ships generators supply electricity at a constant voltage and frequency. For this to happen, what condition must be met?

1. A high-frequency output
2. A low-frequency output
3. The turbines must operate at a variable speed to meet demands of variable loads
4. The turbines must operate at a constant speed under variable loads

6-52. Emergency generators are driven by diesel power rather than steam turbine power because diesel engines have what advantage?

1. They generate more power than turbines
2. They start faster than turbines
3. They are easier to operate than turbines
4. They are less of a fire hazard than turbines

6-53. Special, closely regulated electrical power used for specific loads is furnished by which of the following power suppliers?

1. Turbine generator
2. Diesel generator
3. Motor generator
4. Ship’s service switchboard

6-54. Ship’s service-generating units and their associated distribution switchboards are interconnected to other distribution switchboards by what circuit?

1. Short
2. Bypass
3. Bus tie
4. Alternator

6-55. During load changes, the automatic voltage regulator maintains a constant voltage by varying the

1. armature resistance
2. field excitation
3. generator speed
4. governor speed

6-56. What device is used to isolate a faulty circuit?

1. A resistor
2. A rectifier
3. A circuit breaker
4. A voltage regulator

6-57. What device maintains the generator voltage to within specified limits?

1. A voltmeter
2. A voltage regulator
3. A circuit generator
4. A resistor regulator

6-58. An ac motor has which of the following advantages over a dc motor?

1. It is larger
2. It is smaller
3. It requires less power
4. It rotates at a faster speed

6-59. Shipboard motor controllers are used for which of the following purposes?

1. To start and to stop motors
2. To increase or decrease motor speed
3. To reverse the direction of a rotating shaft
4. Each of the above

6-60. Which of the following pieces of equipment may be equipped with electric brakes?

1. Anchor windlasses
2. Auxiliary pumps
3. Switchboards
4. Generators

6-61. When supply voltage has been restored, what type of motor controller will (a) automatically restart the motor and (b) require manual startup?

1. (a) High-voltage release
   (b) low-voltage protection
2. (a) High-voltage release
   (b) high-voltage protection
3. (a) Low-voltage release
   (b) low-voltage protection
4. (a) Low-voltage release
   (b) high-voltage protection

6-62. You should protect batteries from salt water for which of the following reasons?

1. To prevent release of poisonous gases
2. To prevent the battery from being ruined
3. Both 1 and 2 above

6-63. In which of the following ways are the power and lighting distribution systems different?

1. The systems have different power sources
2. The power distribution system carries higher voltage
3. The power distribution system’s cables are more numerous
4. The lighting distribution systems have larger cables

6-64. As required by shipboard electric safety programs, all personally owned electrical equipment must be checked before being used aboard ship.

1. True
2. False

6-65. Before repairs can be made to an electric motor, which of the following precautions must be met?

1. The controller must be tagged out
2. The circuit must be disconnected
3. Both 1 and 2 above
4. The pump end of the motor must be disconnected

6-66. Heat stress is the body’s inability to cope with a high-temperature and high-humidity environment. The term “heat stress” is a general term used to describe which of the following physical problems?

1. Heat cramps
2. Heatstroke
3. Heat exhaustion
4. All of the above

6-67. What type of heat stress is life threating?

1. Heat exhaustion
2. Heat cramps
3. Heatstroke

6-68. When administering first aid to a heatstroke victim, what step should you take first?

1. Lower the victim’s body temperature
2. Administer a salty, cool liquid
3. Cover the victim with a blanket and elevate the head
4. Cover the victim with a blanket and elevate the feet

6-69. You should NOT take which of the following actions when working in conditions that could cause heat stress?

1. Drink commercially prepared electrolyte supplements
2. Wear starched clothes
3. Take salt tablets
4. Each of the above

6-70. The ships Oil Spill Containment and Cleanup Kit (O.S.C.C.K.) consists of which of the following materials?

1. Porous mats, grappling hooks, boat hooks, metal containers, and a fire retardant
2. Porous mats, a chemical fire retardant, grappling hooks, plastic bags, and an instruction book
3. Porous mats, grappling hooks, boat hooks, plastic bags, and an instruction book
4. A chemical fire retardant, grappling hooks, plastic bags, porous mats, and an instruction book

6-71. Continued exposure to impulse or impact noise greater than 140 decibels can cause which of the following hearing losses?

1. Normal
2. Severe
3. Slight
4. Intermittent

6-72. Personnel who work with asbestos and smoke should be aware that their chances of contracting lung cancer are increased by which of the following rates?

1. Tenfold
2. Twentyfold
3. Fiftyfold
4. Ninetyfold

6-73. When work is being done on refrigeration systems, the area should be monitored with which of the following devices?

1. A low-pressure gauge
2. A flame safety lamp
3. A halide monitor
4. A TLV detector

6-74. To alleviate the detrimental effects of shipboard sewage on the environment, which of the following devices are installed on Navy ships?

1. High-concentration sewage devices
2. Chemical sanitation devices
3. Marine sanitation devices
4. Pier-side devices

6-75. Zero liquid discharge is a design feature of which of the following MSD systems?

1. LHA
2. Jered
3. LPA
4. Jiffy